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PARASITES OF WESTERN AUSTRALIA

X

LABIDOCARPINAE FROM BATS (ACARI: LISTROPHOROIDEA, CHIRODISCIDAE)

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&

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ABSTRACT

Eight named species of labidocarpine fur-mites belonging to four genera are recorded from Western Australian bats: *Labidocarpus australiensis* sp. nov., *Olabidocarpus malayi* Fain, *Alabidocarpus recurvus* Womersley, *A. fujii* Wada, *A. yandinae* Domrow & Moorhouse, *A. yandinae intersitus* subsp. nov., *A. chalinolobi* sp. nov., *A. parvulus* sp. nov. and *Dentocarpus (Paradentocarpus) kimberleyensis* sp. nov. Two forms of *Alabidocarpus* could not be determined.

INTRODUCTION

The labidocarpine fur-mites of Australian bats were reviewed by Domrow & Moorhouse (1975) who recorded four species in two genera: *Alabidocarpus recurvus* (Womersley, 1943), *A. yandinae* Domrow & Moorhouse, 1975, *A. fujii* Wada, 1967 and *Dentocarpus chaerephon* Fain, 1970.

During the Western Australia Field Programme the junior author collected many labidocarpines on various species of bats. These mites belong to 10 species and four genera and include four new species and one new subspecies. This material is studied below.

The holotypes and allotypes of the new species are deposited in the Western Australian Museum, Perth (WAM). Paratypes are in the Field Museum of Natural History, Chicago, U.S.A. (FMNH) and in the authors' collections Department of Zoology, University of Nijmegen, The Netherlands (DZUN) and Institute of Tropical Medicine, Antwerp (IMT). Paratypes of

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Labidocarpus australiensis sp. nov. and *Alabidocarpus chalinolobi* sp. nov., and specimens of *Olabidocarpus malayi* Fain, 1970, are deposited as follows: United States National Museum, Washington (USNM); Institute of Acarology, Columbus (IA); Museum d'Histoire Naturelle, Paris, France (MHNP); British Museum, Natural History, London (BM); Rijksmuseum Natural History, Leiden, The Netherlands (RMNH); Hamburg Museum of Natural History, Germany (HM); Museum of Natural History, Frankfurt (MNHF); Academy of Tchecoslovaquia, Prague (AT); Institut royal des Sciences naturelles, Brussels (IRSNB), and Queensland Institute of Medical Research (QIMR).

The length of the body includes the gnathosoma.

SYSTEMATICS

Order Astigmata
Family Chirodiscidae Trouessart, 1892
Subfamily Labidocarpinae Gunther, 1942
Genus *Labidocarpus* Trouessart, 1895

Labidocarpus australiensis sp. nov.

Diagnosis

This species is distinguished from *Labidocarpus rollinati* Trouessart, 1895 in both sexes by the different aspect of the lateral sclerotized areas, which are smaller and more regularly rectangular and have anterior border sinuous. In the male these areas number only 10 (11-12 in *L. rollinati*) and the striations only 14 (17-19 in *L. rollinati*).

Description

Holotype: female (Fig. 1) 330 μm long, 120 μm wide. Cuticle with 32 striations in midline and bearing laterally 13 small shields on one side and 12 on other. Gnathosoma 40 μm long, prescapular shield 75 μm long (in midline). Legs III larger than legs IV. Tarsus III with apical curved spine 27 μm long, tarsus IV with similar but shorter spine (18-20 μm). Chaetotaxy: setae *sc i*, *sc e* and *h* 25 μm, 8 μm and 45 μm long respectively. Posterior extremity with two pairs of setae 45 μm and 105 μm long respectively.

Allotype: male (Fig. 2) 270 μm long, 105 μm wide with 10 lateral shields and 15 transverse striations (in midline). Gnathosoma 36 μm long, prescapular shield 72 μm long. Opisthosomal shield 78 μm long. Legs as in *L. rollinati* but apical peduncle of tarsus III more conical and apical spine more curved. Chaetotaxy: setae *sc i*, *sc e* and *h* 25-30 μm, 4 μm and 40 μm long respectively. Posterior extremity with one pair of long setae (80 μm) and one pair of short setae; a third pair of very small setae is present more internally and is not visible from outside.

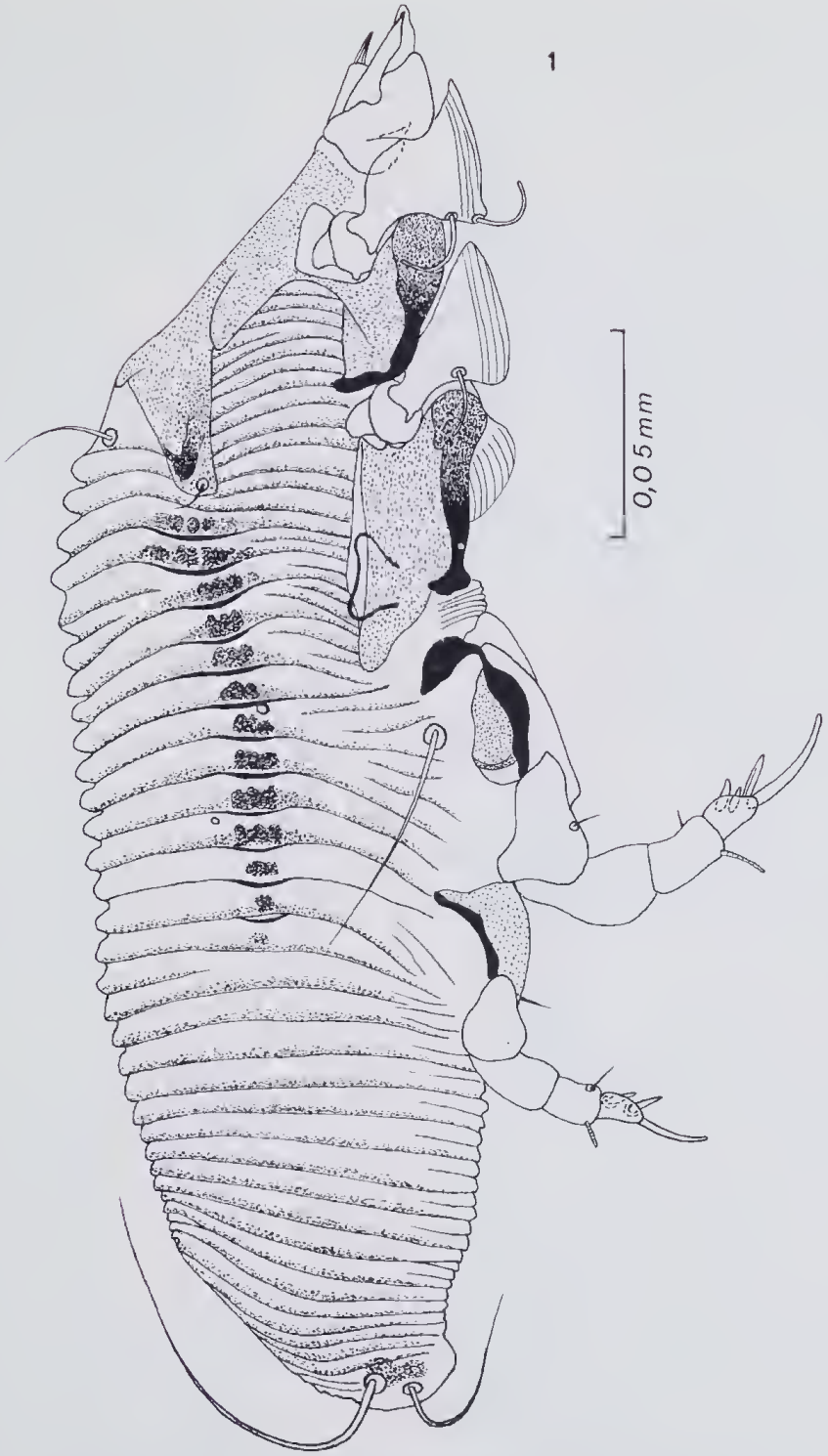

Fig. 1: *Labidocarpus australiensis* sp. nov. Holotype female.

Fig. 2: *Labidocarpus australiensis* sp. nov. Allotype male.

Host and locality

Holotype: WAM 80-334, parasitic on *Hipposideros ater* Templeton, 1848, collected at Geikie Gorge, Western Australia (18°05'S, 125°43'E), 6.X.1976. Host registration FMNH 2959.

Allotype: from the same animal WAM 80-336.

Paratypes: 26 from the same animal, WAM 80-150 to 80-162, 80-335. Host registration numbers FMNH 2959 and 2862. From the same animal: 34 paratypes (males, females and immatures). From the same host but 3.X.1976 (eight females and 28 immatures all paratypes) and 7.X.1976 (42 females, 19 males, nine immatures all paratypes). Paratypes are deposited in the following institutions: USNM, two females, one male, one nymph; FMNH, 25 females, three males, three nymphs; MHNP, two females, one nymph; BM, two females, one male, one nymph; IA, two females, one male; RMNH, two females, one male; AT, three females, one male; HM, two females, one male, one nymph; QIMR, three females, one male; IMT, 22 females, three males, 13 nymphs; DZUN, 25 females, three males, 13 nymphs.

Genus *Olabidocarpus* Lawrence, 1948

Olabidocarpus malayi Fain, 1970

The type series of *O. malayi* (from *Pterygistes stenopterus*, Kuala Lumpur), cannot be separated from our specimens, which were found attached to the body hairs of *Eptesicus douglasi* Kitchener 1976, Geikie Gorge, 4, 20 and 30.X.1976 (60 females, 30 males and immatures).

Genus *Alabidocarpus* Ewing, 1943

To the three species already recorded from Australia, F.S.L. was able to add two new ones. All four are keyed below.

Key to Females of Genus *Alabidocarpus* in Australia

1 Body in larvigerous females more than 1 000 μm long. Setae *g p* short and thick spines. Gnathosoma with four strong horns. On *Miniopterus* spp. ..... *A. fujii* Wada, 1967

Body in larvigerous females not more than 637 μm long. Setae *g p* thin and long. Gnathosoma with horns less developed 2

2 Larger species (415 to 637 μm). Posterior border of prescapular shield not sinuous and without rounded prolongations 3

Small species (less than 250 μm). Posterior border of prescapular shield sinuous (**Fig. 6**) and with four small rounded prolongations. On *Eptesicus* spp. ..... *A. parvulus* sp. nov.

3 Prescapular shield with distinct triangular posterolateral projections (**Fig. 4**). Gnathosoma with well-developed horns. On *Chalinolobus gouldii* ..... *A. chalinolobi* sp. nov.

Prescapular shield without distinct triangular posterolateral projections. Gnathosoma variable 4

4 Gnathosoma with horns poorly developed. Prescapular shield narrow, not produced laterally. Body 390-415 μm long. On *Nyctophilus geoffroyi* ..... *A. recurvus* (Womersley, 1943)

Gnathosoma with well-developed horns. Prescapular shield wider, with corners slightly produced. Body 615-637 μm long. On *Rhinolophus megaphyllus* and *Eptesicus* spp. . *A. yandinae* Domrow & Moorhouse, 1975

Alabidocarpus recurvus (Womersley, 1943)
Labidocarpus recurvus Womersley, 1943: 17
Alabidocarpus recurvus Domrow, 1959: 238 (in part), Fain, 1972: 182

This species was described from an unidentified bat in Australia. Fain (1972) illustrated the holotype female. Domrow & Moorhouse (1975) recorded the species from *Nyctophilus geoffroyi* Leach, 1822 and figured the male.

The species is characterized by the presence on the posterior border of gnathosoma of four quite distinct horns, but these are much less developed than in *A. calcaratus* Lawrence. The prescapular shield is short, narrow and with its lateral corners rounded and not produced. In the female seta *sh* is spinous and seta *g p* long and thin. Tarsus IV, in both sexes, bears a simple seta longer than the corresponding apical spine.

We attribute to this species two females found on the nasal vibrissae of (1) *Tadarida jobensis* (Miller, 1902), Mount Hart (16°48′S, 124°56′E), 11.IX.1976, and (2) *Nycticeius greyi* (Gould, 1858), Beverley Springs (16°35′S, 125°29′E), 21.IX.1976.

Alabidocarpus fujii Wada, 1967

This species was described from *Miniopterus schreibersi niponiae* in Japan. Domrow & Moorhouse (1975) recorded it from *M. australis* Tomes, 1858, in Papua New Guinea and Australia. A.F. found one female and one larva on *M. australis*, from the New Hebrides.

According to the original drawing of Wada, setae *g p* are short spines in the female and simple setae in the male. This character, the strongly horned gnathosoma and the narrow and short aspect of the prescapular shield not produced laterally, are shared by *A. calcaratus* Lawrence. *A. fujii* therefore appears very close to the latter species. Males are distinguished by the presence in *A. calcaratus* of a long simple seta on tarsi IV (this seta short in *A. fujii*) and the smaller length of the median pair of terminal setae.

Alabidocarpus yandinae Domrow & Moorhouse, 1975
Alabidocarpus recurvus Domrow, 1959: 238 (in part)
non Alabidocarpus recurvus Womersley, 1943

This species was described from *Rhinolophus megaphyllus* Gray, 1834 in Australia.

According to Domrow's (1959) figures, the gnathosoma is distinctly horned, though less than in *A. calcaratus* and *A. fujii*, and the posterior margin of the prescapular shield is slightly produced laterally. Setae *g p* in the female are long and thin and tarsus IV bears a simple seta shorter than the corresponding apical spine.

Alabidocarpus yandinae intersitus subsp. nov.

Diagnosis

This subspecies differs from the typical form by the greater development and pointed aspect of the four gnathosomal horns, the shorter apical spine of tarsus III compared with that of tarsus IV (ratio 1 : 2), the greater length of the thin seta of tarsus IV, and the shape of the prescapular shield (less produced laterally).

Description

Holotype: female (larvigerous) 615 μm long, 210 μm wide (maximum). Lengths of gnathosoma 63 μm (to tip of submedian horns), of prescapular shield 70 μm (in midline). Gnathosoma with four pointed horns, submedians 18 μm long. Prescapular shield with broadly rounded lateral corners. With 50 transverse striations in midline. Apical spine of leg III 24 μm long, of leg IV 48 μm (measured in straight line). Chaetotaxy: *sh* a spine 18 μm long;

h and *l* 5 140 μm long, setae *g p* long and very thin. Tarsus IV with thin seta 75 μm long.

Allotype: male (Fig. 3) 395 μm long, 170 μm wide. Gnathosoma and prescapular shield as in female but gnathosomal horns longer (21 μm for paramedian). Posterior extremity with three pairs of long setae, middle pair longest.

Host and locality

Holotype: WAM 80-337, parasitic on *Eptesicus douglasi*, collected at Beverley Springs, Western Australia (16°35'S, 125°29'E), 20.IX.1976. Host registration FMNH 2745.

Paratypes: one female from the same animal, WAM 80-179. Paratypes from the same host from Geikie Gorge (18°05'S, 125°43'E), host registration FMNH 2931, 5.X.1976; WAM 80-338, allotype male and WAM 80-178 one paratype female; FMNH, one female, one male and two nymphs. Paratypes from *Eptesicus pumilus* (Gray, 1841), Mitchell Plateau, Western Australia (14°50'S, 125°49'E), 23.X.1976; DZUN, one male and one female; IMT, one female and one nymph.

Alabidocarpus chalinolobi sp. nov.

Diagnosis

This species closely resembles *A. calcaratus intercalatus* Fain 1971, briefly described from *Myotis myotis* in Belgium. In both species the prescapular shield is produced laterally in a triangular pointed projection, the gnathosoma bears four strong horns and setae *g p* are thin and long. However, the new species is distinguished from *A. c. intercalatus* by the more incised shape of the posterior border of gnathosoma, the smaller number of dorsal striations and in the male by the different shape of the opisthosomal shield.‡

Description

Holotype: female (Fig. 4) idiosoma 615 μm long, 185 μm wide (larvigerous). Gnathosoma with four strong horns (paramedian 20 μm long) smaller than in *A. calcaratus*. Prescapular shield with lateral triangular projections. Length of gnathosoma 66 μm (paramedian horn included), of prescapular shield 70 μm in midline and 102 μm along lateral prolongation; 49 transverse striations in midline. Legs: apical spine of tarsus III 27 μm long, of tarsus IV 51 μm long. Tarsi III-IV with fine seta longer than the apical spine; thick lateral spine on tarsus IV lacking. The two ridged

‡ We now consider that *A. calcaratus intercalatus* is specifically distinct from *A. calcaratus* Lawrence, 1952.

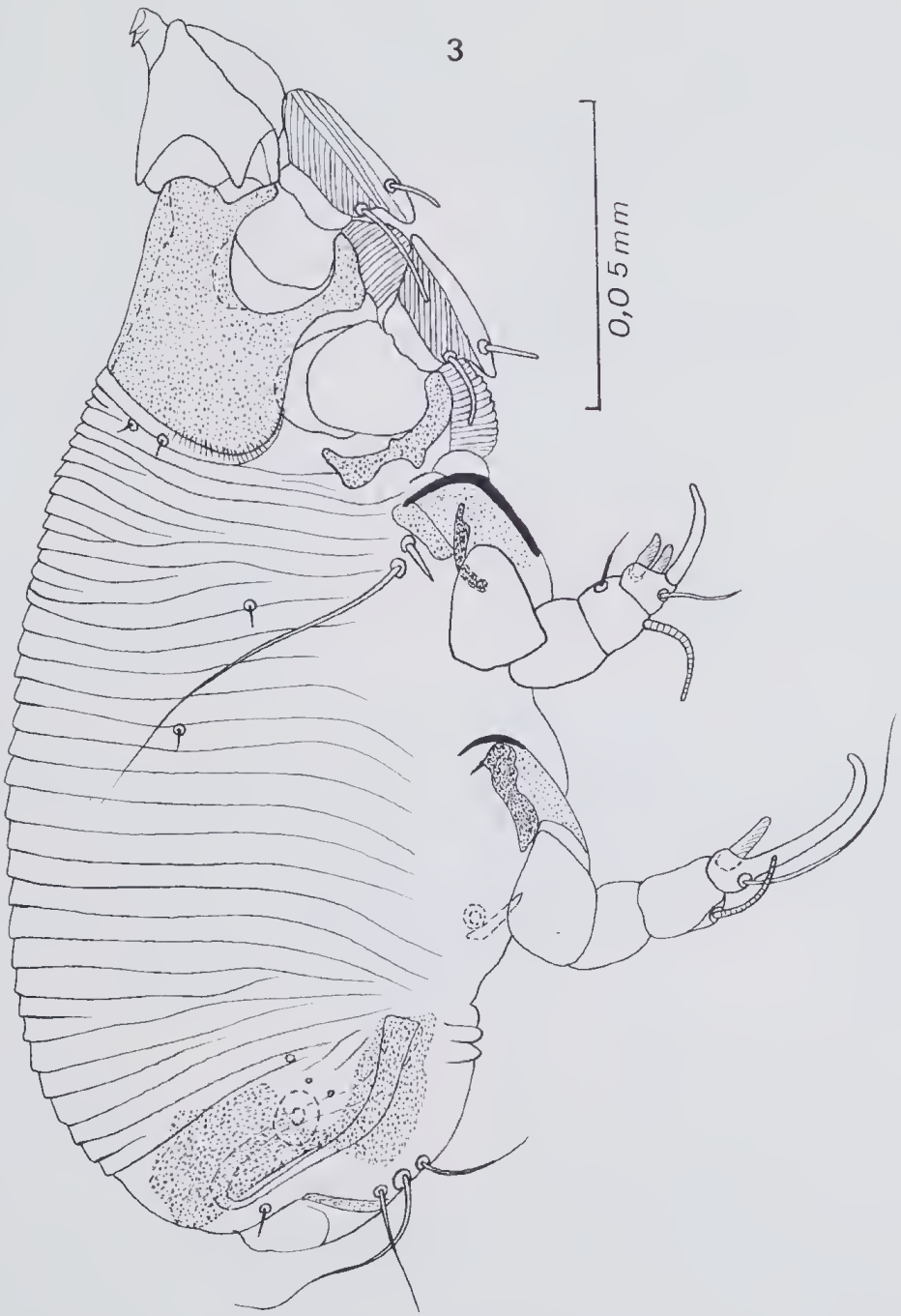

Fig. 3: *Alabidocarpus yandinae intersitus* subsp. nov. Allotype male.

Fig. 4: *Alabidocarpus chalinolobi* sp. nov. Holotype female.

ventral spines on tarsus III are unequal (21 and 12 μm long respectively). Setae *g p* long and thin. Setae *l 5* very long (about 150 μm). Setae *sh* thin spines 18 μm long.

Allotype: male (Fig. 5) 380 μm long, 135 μm wide. Gnathosoma, prescapular shield, setae *sh* and *g p* as in the female. With 30-35 transverse striations in midline (39 striations in *A. intercalatus*). Opisthosomal shield 45 μm long. There are three pairs of long subequal postero-terminal setae (in the paratype, median pair longer than others). Apical spines of tarsi III and IV 27 μm and 60 μm long respectively (latter fused with tarsi).

Host and locality

Holotype: WAM 80-339, from *Chalinolobus gouldii* (Gray, 1841), collected at Beagle Bay, Western Australia (16°59'S, 122°40'E), 23 and 25.VIII.1976. Host registration 2616. Holotype male from the same animal as holotype: WAM 80-340.

Alabidocarpus parvulus sp. nov.

Diagnosis

This very small species resembles *A. eptesicus* Fain 1970, described from Central Africa. It differs, however, in the female by the presence of only one pair of long setae on the posterior extremity of the body.

Description

Holotype: female (Fig. 6) (larvigerous) 230 μm long, 54 μm wide (four paratypes: 210 μm x 60 μm, 213 μm x 55 μm, 223 μm x 57 μm and 225 μm x 55 μm). Gnathosoma 24 μm long (horn included), prescapular shield 28 μm long (in midline). Gnathosoma with two thick, curved paramedian horns. Posterior border of prescapular shield sinuous with four small rounded prolongations. With 39 striations in midline. Setae *sc i*, *sc e* and *sh* vestigial, *h* 45 μm long; setae *l 5* 250 μm, *d 5* 7 μm. Legs III and IV small, ending in rather long spine.

Male unknown.

Host and locality

Holotype: WAM 80-341, from *Eptesicus douglasi*, Geikie Gorge (18°05'S, 125°43'E), 5.X.1976 (from the head). Host registration 2926.

Paratypes: two females from the same animal, FMNH. Paratypes from *Eptesicus pumilus*, Brooking Springs, Western Australia (18°07'S, 125°39'E), 2.X.1976, host registration 288; WAM 80-185 to 80-187; FMNH, four females; DZUN, four females, IMT, three females (and one incomplete female not paratype from Mitchell Plateau, 23.X.1976).

Fig. 5: *Alabidocarpus chalinolobi* sp. nov. Allotype male.

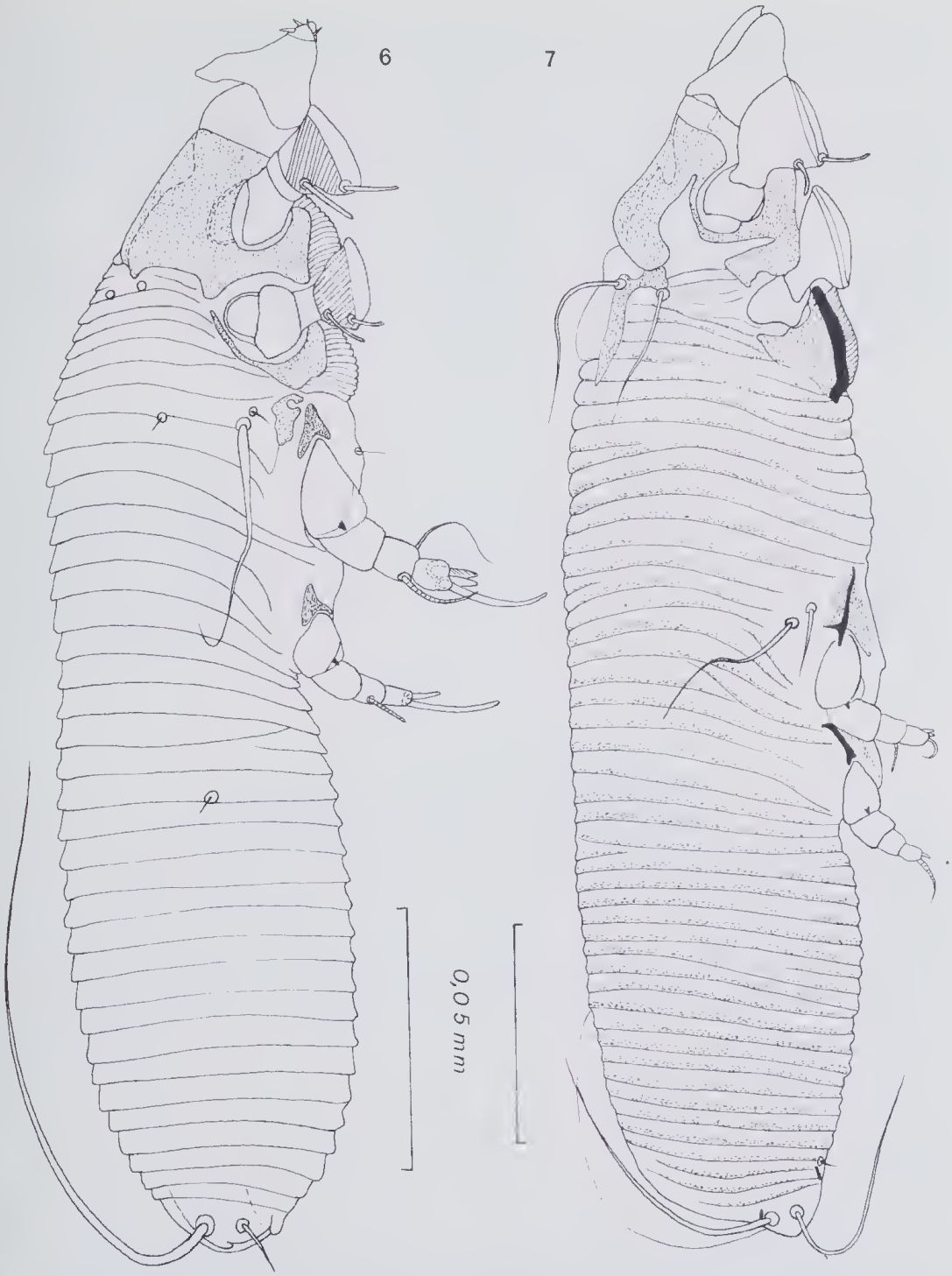

Fig 6-7: *Alabidocarpus parvulus* sp. nov. Holotype female (Fig. 6). *Dentocarpus (Paradentocarpus) kimberleyensis* sp. nov. Holotype female (Fig. 7).

Alabidocarpus sp. indet 1

From the head of *Nycticeius greyi*, Beagle Bay, 23.VIII.1976 and Geikie Gorge (18°05'S, 125°43'E), 21.IX.1976: one male, four specimens (either non-gravid females or male tritonymphs) and two larvae. These specimens (females) are very close to *A. parvulus*. They differ from these by the greater size of the body (slightly longer and thicker; one specimen 250 μm long, 75 μm wide) and the smaller size of the gnathosomal horns.

In many species of Labidocarpinae it is not possible to recognise a non-gravid female from a male tritonymph (Fain, 1971). Thus, in the absence of a larvigerous female, we prefer not to identify these specimens.

Alabidocarpus sp. indet 2

From the head of *Nyctophilus arnhemensis* Johnson 1959, from Beagle Bay (16°59'S, 122°40'E), 23.VII.1976: one male and five specimens that could be male tritonymphs or non-gravid females. These specimens resemble *A. parvulus* except for the greater size of the body (one 'female' is 300 μm long). These specimens are also close to the *Alabidocarpus* sp. 1 but they are slightly larger and in some of them *h* setae are distinctly inflated and *d 5* setae a little longer. More specimens, and especially larvigerous females should be seen before we can identify these specimens.

Genus *Dentocarpus* Dusbabek & Cruz, 1966
Subgenus *Paradentocarpus* Fain, 1976

The genus *Dentocarpus* was previously represented in Australia by *D. chaerephon* (Fain, 1970), found on *Tadarida jobensis* (Miller, 1902) (Domrow & Moorhouse, 1975).

Fain (1976) divided this genus into two subgenera, the subgenus *Paradentocarpus* differing from the typical one by the shape of the prescapular shield (presenting a straight or concave posterior border without any posterior projection).

To the two known species of *Paradentocarpus* (*D. [P.] phyllodermae* Fain, 1976 and *D. [P.] abyssinicus* Fain, 1976), a third species is now added from Australia.

Dentocarpus (Paradentocarpus) kimberleyensis sp. nov.

This new species is clearly distinct from the two other species in the subgenus by the much smaller size of the body, the shape of the postscapular

shields and the different lengths of the setae. Thus, in *D. (P.) abyssinicus* the female is 540 μm long and setae *s h* are more than 100 μm long; in *D. (P.) phyllodermae* the body is 385 μm long, setae *sh* are very short (3 μm), and *h* 25-30 μm long.

Holotype: female (Fig. 7) 279 μm long, 72 μm wide (two paratypes 210 μm x 69 μm and 245 μm x 68 μm). Maximum lengths of gnathosoma 27 μm, of prescapular shield 41 μm. Postscapular paramedian shields poorly sclerotized and shaped in an L (longitudinal portion 25 μm long), bearing setae *sc i* and *sc e*. With 34 transverse striations in midline. Posterior legs very small ending in thick seta that is finely attenuated at apex. Chaetotaxy: setae *sc i*, *sc e*, *sh* and *h* 30 μm, 30 μm, 12-15 μm and 36 μm long respectively. Setae *d 5* and *l 5* 45 μm and 70 μm long respectively.

Male unknown.

Host and locality

Holotype: WAM 80-344 from *Eptesicus douglasi*, from Geikie Gorge (18°05'S, 125°43'E), 20.X.1976. Host registration 2979. Five paratypes from the same host and locality (host registration 2846; 5 and 8.X.1976): WAM 80-193, one female; FMNH, one female; DZUN, one female and one larva; IMT, one nymph.

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